BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Orange

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

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* Depending on the location of Core Habitats, your city or town may not have all of these sections.

Spring Salamander
(Gyrinophilus porphyriticus)
Species of Special Concern

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For more information on rare species and natural communities, please see our fact sheets online at ***www.nhesp.org***

BioMap and Living Waters:
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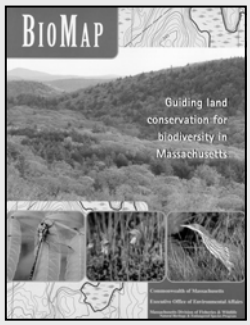
Introduction

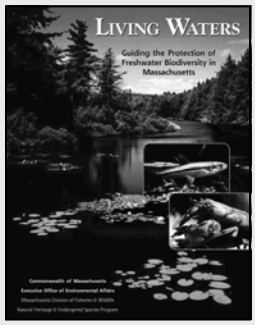
In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generatons to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, ***BioMap*** and ***Living Waters***. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate ***Core Habitats*** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.





Get your copy of the ***BioMap*** and ***Living Waters*** reports! Contact Natural Heritage at 508-792-7270, Ext. 200 or email natural.heritage@state.ma.us. Posters and detailed technical reports are also available.

Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the ***riparian areas***, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as ***Supporting Natural Landscape*** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was

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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, ***Critical Supporting Watersheds*** highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap		
	Species and Verified Natural Community Types	
Biodiversity Group	**Included in BioMap**	**Total Statewide**
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types
Living Waters		
	Species	
Biodiversity Group	**Included in Living Waters**	**Total Statewide**
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

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species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- ***Endangered*** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- ***Threatened*** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- ***Special Concern*** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial ***watch list*** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- ***Critically Imperiled*** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- ***Imperiled*** communities typically have 6-20 sites or few remaining acres in the state.
- ***Vulnerable*** communities typically have 21-100 sites or limited acreage across the state.
- ***Secure*** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The ***Massachusetts Natural Heritage Atlas*** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific ***fact sheets*** at www.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

by Phone *508-792-7270, Ext. 200*

by Fax: *508-792-7821*

by Email: *natural.heritage@state.ma.us*.

by Mail: *North Drive*
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
  - Field guides
  - Natural Heritage Atlas, and more!

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BioMap: Species and Natural Communities

Orange

Core Habitat BM110

Natural Communities

Common Name	Scientific Name	Status
Acidic Rock Cliff Community		Secure
Circumneutral Talus Forest/Woodland		Vulnerable
Northern Hardwoods - Hemlock - White Pine Forest		Secure
White Pine - Oak Forest		Secure

Vertebrates

Common Name	Scientific Name	Status
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM134

Natural Communities

Common Name	Scientific Name	Status
Acidic Shrub Fen		Vulnerable
Circumneutral Talus Forest/Woodland		Vulnerable
Spruce-Fir Boreal Swamp		Vulnerable

Invertebrates

Common Name	Scientific Name	Status
Brook Snaketail	*Ophiogomphus aspersus*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Jefferson Salamander	*Ambystoma jeffersonianum*	Special Concern
Spotted Turtle	*Clemmys guttata*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern

Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM227

Natural Communities

Common Name	Scientific Name	Status
Acidic Graminoid Fen		Vulnerable
Forest Seep Community		Secure
Hemlock-Hardwood Swamp		Secure
Kettlehole Level Bog		Imperiled
Northern Hardwoods - Hemlock - White Pine Forest		Secure
Shallow Emergent Marsh		Secure

Plants

Common Name	Scientific Name	Status
Giant St. John's-Wort	*Hypericum ascyron*	Endangered

Vertebrates

Common Name	Scientific Name	Status
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Jefferson Salamander	*Ambystoma jeffersonianum*	Special Concern
Spotted Turtle	*Clemmys guttata*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM296

Natural Communities

Common Name	Scientific Name	Status
Acidic Rocky Summit/Rock Outcrop Community		Secure
Acidic Talus Forest/Woodland		Secure
Mixed Oak Forest		Secure

BioMap: Species and Natural Communities

Orange

Core Habitat BM299

Natural Communities

Common Name	Scientific Name	Status
Acidic Rock Cliff Community		Secure

Core Habitat BM301

Natural Communities

Common Name	Scientific Name	Status
Circumneutral Talus Forest/Woodland		Vulnerable

Core Habitat BM302

Natural Communities

Common Name	Scientific Name	Status
Acidic Rocky Summit/Rock Outcrop Community		Secure

Core Habitat BM466

Vertebrates

Common Name	Scientific Name	Status
Spotted Turtle	*Clemmys guttata*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern

Core Habitat BM491

Vertebrates

Common Name	Scientific Name	Status
Grasshopper Sparrow	*Ammodramus savannarum*	Threatened
Vesper Sparrow	*Pooecetes gramineus*	Threatened

BioMap: Species and Natural Communities

Orange

Core Habitat BM504

Natural Communities

Common Name	Scientific Name	Status
Acidic Rock Cliff Community		Secure
Acidic Rocky Summit/Rock Outcrop Community		Secure
Acidic Talus Forest/Woodland		Secure
Circumneutral Talus Forest/Woodland		Vulnerable
Kettlehole Level Bog		Imperiled
Level Bog		Vulnerable
Oak - Hemlock - White Pine Forest		Secure
Oak - Hickory Forest		Secure
Ridgetop Chestnut Oak Forest/Woodland		Secure
Shallow Emergent Marsh		Secure

Plants

Common Name	Scientific Name	Status
Climbing Fumitory	*Adlumia fungosa*	Threatened
Muskflower	*Mimulus moschatus*	Endangered

Invertebrates

Common Name	Scientific Name	Status
Beaver Pond Clubtail	*Gomphus borealis*	Special Concern
New England Bluet	*Enallagma laterale*	Special Concern
Sensitive Rare Invertebrate		
Spatterdock Darner	*Aeshna mutata*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Bald Eagle	*Haliaeetus leucocephalus*	Endangered
Blue-spotted Salamander	*Ambystoma laterale*	Special Concern

Common Loon	*Gavia immer*	Special Concern
Eastern Box Turtle	*Terrapene carolina*	Special Concern
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Threatened
Marbled Salamander	*Ambystoma opacum*	Threatened
Southern Bog Lemming	*Synaptomys cooperi*	Special Concern
Spotted Turtle	*Clemmys guttata*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern
Water Shrew	*Sorex palustris*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM527

Natural Communities

Common Name	Scientific Name	Status
Black Gum Swamp		Imperiled

Core Habitat BM537

Natural Communities

Common Name	Scientific Name	Status
Black Gum Swamp		Imperiled

Core Habitat BM540

Natural Communities

Common Name	Scientific Name	Status
Black Gum Swamp		Imperiled

BioMap: Core Habitat Summaries

Orange

Core Habitat BM110

This Core Habitat encompasses many miles of riparian habitats along the Tully River and its tributaries, and represents an excellent opportunity to conserve significant populations of Wood Turtles. There are also several different types of natural communities associated with Tully Mountain, as well as wet, forested areas that support Four-toed Salamanders.

Natural Communities

This Core Habitat contains the many natural communities of Tully Mountain. These include acidic cliffs and talus slopes surrounded by one of the largest and most mature (possibly old-growth) Northern Hardwoods-Hemlock-White Pine Forests in the state. Northern Hardwoods-Hemlock-White Pine Forests have a mix of evergreen and deciduous trees, with a closed, full canopy, and sparse shrub and herbaceous layers. They commonly occur on north facing slopes and ravines with moderately acidic soils.

Vertebrates

The long-term preservation of significant populations of Wood Turtles may be possible within this Core Habitat, along meandering streams, in riparian meadows and swamps, and in upland forests and fields within 600 yards of streams. Significant habitat for Four-toed Salamanders is also present, especially in wet, forested areas dominated by sphagnum moss. The American Bittern, a rare marsh bird, may use the wet meadows and shallow marsh habitats modified by beavers. There is good connectivity of stream-side habitats within this Core Habitat. Protection efforts should seek to maximize the width and connectivity of habitats adjacent to streams.

Core Habitat BM134

This Core Habitat encompasses riparian habitats along a section of the Millers River and several miles of Orcutt Brook and its upper tributaries. It supports the rare Brook Snaketail dragonfly, contains a large wetland with a diversity of natural communities, and provides significant habitat for Wood Turtles and likely other rare reptiles and amphibians as well.

Natural Communities

The northern portion of this Core Habitat contains a large, well-buffered wetland that includes a Spruce-Fir Boreal Swamp of moderate size and quality and an Acidic Shrub Fen of considerable size, no disturbances, and excellent habitat diversity. Spruce-Fir Boreal Swamps are forested wetlands dominated by Red Spruce and Balsam Fir. These swamps are typically found at stream headwaters or in poorly drained basins. Meanwhile Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage.

Invertebrates

The southern part of this Core Habitat (in Orange) includes a 2-km stretch of the Millers River, which along with its tributaries provides habitat for the rare Brook Snaketail dragonfly. Much of the surrounding landscape is undeveloped, which protects the good water quality needed by the Brook Snaketail. While some of the Brook Snaketail's habitat is within the Orange State Forest, much of it appears to be unprotected.

Vertebrates

This Core Habitat contains significant habitat for Wood Turtles in the wider, slower-moving streams and adjacent wetlands and uplands. Spotted Turtles have also been observed here. The brooks and cool seeps likely provide habitat for Spring Salamanders, and the forested wetlands, especially where sphagnum moss is abundant, likely provide habitat for Four-toed Salamanders. The clusters of vernal pools surrounded by mature forest may support populations of Jefferson Salamanders.

Core Habitat BM227

This Core Habitat encompasses an important wetland complex, a large tract of mature mixed deciduous and coniferous forest, and riparian habitats along many miles of Moss and Darling Brooks. It supports several rare species of turtles and salamanders, and it contains one of the state's few populations of the Endangered Giant St. John's-Wort.

Natural Communities

In Warwick, this Core Habitat contains a high-quality wetland complex, including a large and diverse Shallow Emergent Marsh and a small, yet well-developed, Acidic Graminoid Fen. The Shallow Emergent Marsh community is a graminoid wetland found in broad, flat areas bordering rivers or along pond margins. It commonly occurs in abandoned beaver ponds, and differs from Deep Emergent Marsh in having less standing water. Meanwhile, Acidic Graminoid Fens are sedge and Sphagnum-dominated acidic peatlands that experience some groundwater and/or surface water flow but no calcareous seepage. Standing water is often present throughout much of the growing season. Here the fen is well-buffered by a large tract of mature and disturbance-free Northern Hardwoods-Hemlock-White Pine Forest.

Plants

One of only three Massachusetts populations of the Endangered Giant St. John's-Wort is found within this large Core Habitat.

Vertebrates

This Core Habitat encompasses riparian and upland habitats along over 10 miles of small streams and brooks. The meandering, slower-moving streams with associated forested wetlands and wet meadows are inhabited by Wood and Spotted Turtles. Jefferson Salamanders use clusters of vernal pools and nearby forested uplands. Four-toed Salamanders may be present in shallow pools and seeps where sphagnum moss is abundant, and high-gradient, cold brooks may support significant populations of Spring Salamanders.

BioMap: Core Habitat Summaries

Orange

Core Habitat BM296

Natural Communities

This Core Habitat contains the many natural communities of Tully Mountain. These include an Acidic Rocky Summit/Rock Outcrop community and an Acidic Talus Forest. Acidic Rocky Summits are open communities of shrubs, scattered grasses, mosses, lichens and occasional trees found on exposed rocky summits. These areas are dry with little soil, and can often be found as patches within other ridgetop communities. Meanwhile, Acidic Talus Forest communities develop on boulder strewn slopes below cliffs, with scattered trees, tall shrubs, vines, and ferns. There is often a gradient of vegetation density as the slope changes, with more trees on the lower slope. Here these communities are embedded in a Mixed Oak Forest.

Core Habitat BM299

Natural Communities

Although small, these Acidic Rock Cliff communities have good species and habitat diversity and are embedded within a large landscape of natural vegetation, thus contributing to the habitat diversity of Tully Mountain. Acidic Rock Cliffs are open communities of extremely sparse plants, with occasional dense lichen, on ledges and in crevices of acidic cliff faces. Acidic Rock Cliff communities are often below Acidic Rocky Summits and above Acidic Talus Slopes.

Core Habitat BM301

Natural Communities

This Core Habitat contains a Circumneutral Talus Forest of good size and species diversity. Circumneutral Talus Forest communities develop on boulder strewn slopes below certain cliffs, with scattered trees, shrubs, vines, and ferns. There is often a gradient of vegetation density as the slope changes, with more trees on the lower slope. Here the rocky slope is contained within over 2000 acres of forested land.

Core Habitat BM302

Natural Communities

This Core Habitat contains a moderate-sized Acidic Rocky Summit that is well-buffered by a variety of rocky, natural communities. Acidic Rocky Summits are open communities of shrubs, scattered grasses, mosses, lichens and occasional trees found on exposed rocky summits. These areas are dry with little soil, and can often be found as patches within other ridgetop communities. Here the summit community has a good assortment of plant species and only minor levels of disturbances. It contributes to the overall habitat diversity on Tully Mountain.

BioMap: Core Habitat Summaries

Orange

Core Habitat BM466

Vertebrates

This long Core Habitat, centered on Whetstone Brook and its tributaries, encompasses over four miles of brooks and streams, small riparian forested wetlands, wet meadows, and upland forests. The cold headwater brooks and seeps provide significant and connected habitat for Spring Salamanders. Spotted Turtles are also present here, albeit in lower densities. Four-toed Salamanders may be present in the seeps and swamps where sphagnum moss is abundant. The area within this Core Habitat is largely protected as conservation land.

Core Habitat BM491

Vertebrates

This Core Habitat encompasses the maintained grasslands associated with the Orange Municipal Airport in Orange. These airfield grasslands provide habitat for small breeding populations of Grasshopper Sparrows and Vesper Sparrows.

BioMap: Core Habitat Summaries

Orange

Core Habitat BM504

This, the largest Core Habitat, encompasses all of the Quabbin Reservoir and surrounding watershed lands that together support a tremendous wealth of biodiversity. Highlights include pristine habitats for rare dragonflies and damselflies, a multitude of large, high-quality natural communities, and several rare plant species such as the Endangered Muskflower. The Quabbin Reservoir supports the highest density of breeding Common Loons and Bald Eagles in southern New England. The area also supports other rare vertebrates, from Wood Turtles to Water Shrews.

The Core Habitat includes large tracts of upland forest and riparian habitats to the east of the Quabbin Reservation, Muddy Brook and its tributaries, including Heminway Swamp, and several miles of the East Branch of the Swift River. North of the Quabbin Reservation, it includes the Middle Branch of the Swift River, Blackington Swamp, forested and shrub wetlands near the Spectacle Ponds, and portions of Shutesbury and Wendell State Forests. Between the western edge of Quabbin Reservation and Rte. 2, the Core Habitat includes riparian habitats along Jabish Brook. Conservation of the relatively small remaining areas of unprotected land within this Core Habitat is desirable to increase the amount of contiguous, protected habitat.

Natural Communities

There are extensive Oak-Hickory and Oak-Hemlock-White Pine Forests that surround the Quabbin Reservoir. Oak-Hickory Forests are dominated by a variety of Oak species, with Hickories present in lower densities. They generally occupy well-drained sites, such as upper slopes or ridgetops often with west and south-facing aspects. Here these forests support some of the largest disturbance-free Acidic Talus Forests and Acidic Cliffs in the state. Acidic Talus Forest communities develop on boulder strewn slopes below cliffs, with scattered trees, tall shrubs, vines, and ferns. There is often a gradient of vegetation density as the slope changes, with more trees on the lower slope. Small patches of Ridgetop Chestnut Oak Forests commonly occur on the dry, rocky, summits above these talus slopes. This Core Habitat also contains several high-quality bogs, including one classic northern Kettlehole Level Bog in excellent condition, which is buffered by upland forest and free of disturbance. Kettlehole Level Bogs are acidic dwarf shrub peatlands with little water input or outflow that form in circular depressions left by melting iceblocks in sandy glacial outwash. The vegetation in Kettlehole Level Bogs usually grows in rings.

Plants

This Core Habitat supports a population of the Endangered Muskflower, a small yellow-flowered plant of seeps. Also present is a healthy population of the Threatened Climbing Fumitory, a biennial vine that clambers over rocks.

Invertebrates

Numerous wetlands of many different types are dispersed throughout this Core Habitat, providing pristine habitat for rare dragonflies and damselflies that is located within a very large and unfragmented natural landscape. For example, boggy areas are inhabited by the New England Bluet damselfly, and ponds and coves around the perimeter of Quabbin Reservoir are habitat for the Beaver Pond Clubtail and the Spatterdock Darner dragonflies. It is likely that this Core Habitat is inhabited by many other rare dragonfly and damselfly species.

Vertebrates

The waters and shoreline of the Quabbin Reservoir support the highest density of breeding Common Loons and breeding and wintering Bald Eagles in southern New England. Riparian habitats along Muddy Brook, the Swift River, and Jabish Brook provide significant habitat for Wood Turtles. Populations of Spotted and Eastern Box Turtles, Four-toed, Spring, Marbled, and Blue-spotted Salamanders, Water Shrews, and Southern Bog Lemmings are known from various locations within this Core Habitat, and more populations likely occur here. This Core Habitat also contains one of the largest undeveloped blocks of habitat in central Massachusetts for a variety of forest birds. Conservation efforts should focus on expanding and connecting the large areas of conservation land that are already protected within this Core Habitat.

Core Habitat BM527

Natural Communities

This Core Habitat contains a large, old-growth, Black Gum Swamp of excellent quality. Black Gum Swamps are forested acidic basin wetlands with accumulations of peat that form hummocks and hollows on the ground. Black Gum is the dominant canopy tree, growing primarily on the hummocks, which results in a relatively open canopy. Due to the land-use history of Massachusetts, old-growth forests such as this one are a rare find in the state.

Core Habitat BM537

Natural Communities

This Core Habitat contains a moderately-sized Black Gum Swamp that is well-buffered within a large tract of naturally forested land. Black Gum Swamps are forested acidic basin wetlands with accumulations of peat that form hummocks and hollows on the ground. Black Gum is the dominant canopy tree, growing primarily on the hummocks which results in a relatively open canopy.

BioMap: Core Habitat Summaries

Orange

Core Habitat BM540

Natural Communities

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Living Waters: Species and Habitats

Orange

Core Habitat LW017

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Core Habitat LW194

Invertebrates

Common Name	Scientific Name	Status
Creeper	*Strophitus undulatus*	Special Concern

Core Habitat LW307

Plants

Common Name	Scientific Name	Status
Variable Pondweed	*Potamogeton diversifolius*	Endangered

Invertebrates

Common Name	Scientific Name	Status
Triangle Floater	*Alasmidonta undulata*	Special Concern

Fishes

Common Name	Scientific Name	Status
Bridle Shiner	*Notropis bifrenatus*	Special Concern

Core Habitat LW377

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Core Habitat LW417

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Living Waters: Core Habitat Summaries

Orange

Core Habitat LW017

Fish Brook flows through a large wetland, into the Fish Brook Wildlife Management Area, and empties into the West Branch of the Tully River. The Core Habitat in this brook begins at the Royalston-Orange town lines. Here the brook flows swiftly over and around the stream's cobbles and boulders that provide excellent habitat for many aquatic invertebrates that indicate good water quality. Forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW194

Orcutt Brook supports three freshwater mussel species, including the rare Creeper mussel. This species has been found in an impounded section of the brook where softer sands and gravels allow it to gain a foothold in an otherwise swiftly flowing, rocky brook. There are only nineteen Core Habitats for the Creeper mussel in the state, which represent the water bodies that support the most robust populations of this rare mussel.

Core Habitat LW307

The Millers River supports four of the state's twelve freshwater mussel species, including a vigorous population of the rare Triangle Floater that is distributed throughout the river. This mussel is found in deposits of sand and gravel that are out of the way of the swift current, such as those found along sandy shorelines, in backwaters, behind large boulders, in pools below riffles, and in slower-flowing runs.

A section of the Millers River in Orange also supports one of three known population of Bridle Shiner in the Millers Watershed. This Core Habitat supports a second Bridle Shiner population in Willow Brook and its tributaries in New Salem and Athol. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes.

This Core Habitat is also important because the Commonwealth's only known population of the Endangered Variable Pondweed grows in the waters of Lake Rohunta. This species is nearing the northern extent of its range in Massachusetts. Native freshwater plants like the Variable Pondweed are a key component of aquatic ecosystems, providing habitat and nutrition for fishes and invertebrates, and adding oxygen to the water through photosynthesis.

Core Habitat LW377

This section of Cheney Brook encompasses beaver impoundments both up and downstream. The Core Habitat supports a great diversity of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The streambed is made up of a mix of cobbles and smaller materials that provide excellent habitat for these aquatic invertebrates. The stream is surrounded by a forested swamp dominated by Eastern Hemlock and Red Maple, with

abundant White Pine in higher areas. The forested stream banks and adjacent wetlands help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves, sticks, and other organic matter, and by controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW417

The West Branch of the Tully River supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. Naturally vegetated stream banks along the Core Habitat and upstream help maintain the habitat quality, shading the water to keep it cool and controlling the runoff of sediments, excess nutrients, and water.

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